

METHODS OF FORMING RUTHENIUM FILM BY CHANGING PROCESS  
CONDITIONS DURING CHEMICAL VAPOR DEPOSITION AND RUTHENIUM  
FILMS FORMED THEREBY

**Abstract of the Disclosure**

A ruthenium (Ru) film is formed on a substrate as part of a two-stage methodology. During the first stage, the Ru film is formed on the substrate in a manner in which the Ru nucleation rate is greater than the Ru growth rate. During the second stage, the Ru film is formed on the substrate in a manner in which the Ru  
5 growth rate is greater than the Ru nucleation rate.